

December 19, 2001

MEMORANDUM TO: William D. Travers  
Executive Director for Operations

FROM: Samuel J. Collins, Director/**RA/ B. Sheron for:**  
Office of Nuclear Reactor Regulation

SUBJECT: RESOLUTION OF GENERIC SAFETY ISSUE (GSI) 173A, "SPENT  
FUEL STORAGE POOL FOR OPERATING FACILITIES"

The staff has completed all actions planned for the resolution of Generic Safety Issue (GSI) 173A, "Spent Fuel Storage Pool for Operating Facilities." The staff recognizes that the terrorist attacks of September 11, 2001, prompted consideration of additional threats to the safe storage of irradiated fuel. In part to address these concerns, Chairman Meserve directed the staff to conduct a comprehensive review of the safeguards for nuclear materials and the physical security of nuclear facilities by memorandum dated September 28, 2001. Since these concerns are being addressed outside the scope of GSI-173A, the staff will close the issue with no new or revised requirements.

The genesis of GSI-173A was a report filed in 1992 under Part 21 by two engineers working under contract at the Susquehanna Plant. The engineers contended that Susquehanna spent fuel pool (SFP) failed to meet regulatory requirements with respect to a sustained loss of pool cooling function after a loss-of-offsite-power or a loss-of-coolant-accident. Specifically, the engineers contended that: (1) SFP cooling could not be reliably recovered following postulated events and (2) SFP boiling could adversely affect systems required for safe shutdown of an adjacent operating reactor. Additional concerns involving potential loss of coolant inventory and operational deviation from design assumptions, which were revealed through operational events, caused the staff to expand the scope of review to include: pool configurations during refueling, refueling seal reliability, piping system interfaces with SFPs, SFP monitoring instrumentation, and consistency of operations with SFP design assumptions.

In resolving this issue, the staff implemented an action plan for operating reactors that involved: gathering technical information for all operating reactors through plant visits, reviews of design and licensing documents, and performance of a survey using regional personnel; analyzing capabilities to maintain safe storage conditions for irradiated fuel at each site; and developing proposed actions to address identified concerns. In a report dated July 26, 1996, the staff reported its proposed resolution of issues identified through these activities to the Commission.

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The principal actions identified for resolution involved:

- expanding the scope of proposed rulemaking for shutdown operations to include spent fuel pool operations
- performing plant-specific evaluations of certain design features found at individual plants that increased the potential for a loss of coolant inventory, a sustained loss of forced cooling, or adverse effects on operating reactor systems from boiling SFPs.

In a memorandum dated December 11, 1997, the Commission denied authorization for the staff to proceed with rulemaking governing shutdown operations. However, the staff proceeded with the plant-specific evaluations and reported the results to the Commission by memorandum dated September 30, 1997. For representative plants having one or more of the design features of concern, the staff estimated the frequency of a significant loss of coolant inventory or a sustained loss of cooling, which were selected as conservative surrogate conditions for fuel damage. These estimated frequencies were compared against screening criteria developed for reactor accidents to assess the need for new or revised requirements. The screening criteria used for comparison with the endstate frequencies were: below 1E-06 per year, no action; between 1E-06 and 1E-05 per year, engineering judgement was used to determine need for detailed evaluation; and above 1E-05, a detailed evaluation would be performed. Several licensees took voluntary actions to address the concerns identified at their facilities. For the remaining facilities, the staff concluded that no new or revised requirements were justified.

In June 2000, the staff met with the Advisory Committee on Reactor Safeguards (ACRS) to discuss the staff's proposed closure of GSI-173A. In their letter of June 20, 2000, the ACRS recommended that the staff re-evaluate the screening criteria considering the potential differences in radioactive material release associated with a spent fuel pool accident. On July 20, 2000, the staff responded to the ACRS accepting its recommendations to delay closing GSI-173A until the staff completed its re-evaluation of the SFPs at decommissioning plants and considered the need to develop new screening criteria for regulatory analyses of SFP accidents at operating reactors (Attachment 1).

On June 11, 2001, the staff sent a letter to the ACRS that outlined its review of screening criteria developed in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," and recommended that GSI-173A be considered resolved because the screening criteria maintained an adequate margin to the Commission's quantitative health objectives for spent fuel pool accidents (Attachment 2). During the 486<sup>th</sup> meeting of the ACRS, October 4-6, 2001, the Committee reviewed and accepted the staff's

proposed resolution of GSI-173A. In its letter of October 15, 2001, to Chairman Richard A. Meserve, (Attachment 3) the Committee concluded that the staff's screening criteria were appropriate for regulatory analyses of SFP accidents at operating plants, and considered GSI-173A closed. The staff, therefore, will close this GSI with no new or revised requirements.

Attachments:

1. Letter dated July 20, 2000, from William D. Travers, Executive Director for Operations, NRC, to Dr. Dana Powers, ACRS, Subject: Proposed Resolution of Generic Safety Issue (GSI) 173A, "Spent Fuel Storage Pool For Operating Facilities."
2. Letter dated June 11, 2001, from Gary M. Holahan, NRR, to John T. Larkins, ACRS, Subject: "Resolution of Generic Safety Issue (GSI) 173A, "Spent Pool Cooling for Operating Plants."
3. Letter dated October 15, 2001, from George E. Apostolakis, ACRS, Subject: "Proposed Resolution of Generic Safety Issue (GSI-173A), Spent Fuel Storage Pool for Operating Facilities."

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\* See previous concurrence

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